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ABSTRACT

Ieoh Ming (I. M.) Pei, born in Canton, China, came to the United States in 1935 to study architecture, first at the University of Pennsylvania, then at the Massachusetts Institute of Technology, and at Harvard University's Graduate School of Design. Today, Pei's reputation and architectural contributions are renowned worldwide. He has designed hotels, hospitals, airports, and corporate centers, and some of his best known works are libraries and museums. Stylistically, Pei is considered to be a modernist because of his strict adherence to geometry and the use of elementary forms, yet his architecture defies simple categorization. This teaching guide discusses one of I. M. Pei's most famous buildings, the East Building of the National Gallery of Art on the National Mall, in Washington, DC, dedicated on June 1, 1978. The guide first gives background information on the East Building and on I. M. Pei's career. It then discusses the East Building in detail, with particular attention to its interior. The guide provides 11 illustrations of sketches, scale models, and interior designs for the East Building. Presents classroom activities for elementary school, middle school, and high school students. Contains 2 resources. (BT)

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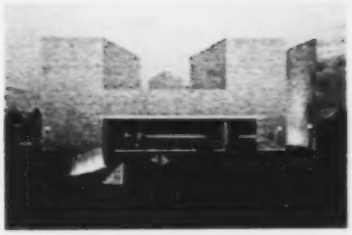
I.M. Pei's East Building

A Guide for Teachers



East Building, 4th Street façade.
Photograph by Dennis Brack/Black Star

National Gallery of Art, Washington, DC.

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F. P. Smith

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I.M. Pei's East Building - Solving Problems of Form and Function

Teacher's Guide

This teaching guide was prepared by Heidi Hinish, family program coordinator, Department of Teacher and School Programs, National Gallery of Art, Washington, D.C. Additional information is available on the National Gallery's web site at **http://www.nga.gov**

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I.M. Pei's East Building - Solving Problems of Form and Function

I sketched a diagonal line across the trapezoid and produced two triangles. That was the beginning. --I.M. Pei

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When Andrew Mellon gave the original West Building of the National Gallery of Art to the nation, he had already anticipated the museum's eventual expansion. In a letter to President Franklin D. Roosevelt in 1936, Mellon specified the "Mall building space on the north between Third and Fourth Streets, NW shall be reserved for future extensions." This stipulation in Mellon's gift was later included in the legislation establishing the National Gallery of Art.

For many years, Mellon's claim of the adjacent "Mall building space" for the museum seemed premature. The West building opened with many of its galleries incomplete or vacant. By the mid-1960s, however, circumstances had radically changed. The museum's galleries were filled and new space was needed for large-scale, modern artworks.

Mellon had chosen architect John Russell Pope, one of the leading architects of the first half of the twentieth century to design the West Building. Not surprisingly, Mellon's son Paul, looked to a forward-thinking architect of the second half of the twentieth century, I.M. Pei, to design the East Building. On June 1, 1978, the East Building was dedicated to the people of the United States.

About the Artist

Ieoh Ming Pei (pronounced: eeyo ming pay), the son of a banker, was born in Canton, China, and grew up in Shanghai. Pei came to America in 1935 to study architecture, first at the University of Pennsylvania, then at the Massachusetts Institute of Technology and Harvard's Graduate School of Design. Pei's reputation and architectural contributions are renowned worldwide. He has designed hotels, hospitals, airports, and corporate centers; some of his best known works are libraries and museums. Major museum commissions include: the Rock and Roll Hall of Fame Museum in Cleveland, the new entrance to the Louvre in Paris, France, and most recently, the Miho Museum in the Shigaraki mountains of Japan. Stylistically, Pei is considered by many to be a modernist because of his strict adherence to geometry and the use of elementary forms, yet his architecture defies simple categorization.

Working Within Limits

The task facing Pei was daunting. He would have to resolve several problems concerning the building's form and function. The small trapezoidal plot reserved for the building was a difficult site for a grand museum structure. Its north side was limited by the angle created by Pennsylvania Avenue, and its south end abutted the

National Mall. Building lines on both sides were restricted because the land was adjacent to the President's inaugural route. Still, the new building on its small site would need to match the monumental scale of the Mall and harmonize with the neoclassical West Building.

Located at the base of Capitol Hill, the building site was a swampy patch of land where early members of Congress once paused to shoot ducks en route to the White House. By the 1960s the land was used for tennis courts and was the last undeveloped plot on the north side of the National Mall.

Pei's plan for the East Building employed forms that worked with the shape of the land. Shortly after a meeting with Gallery trustees, Pei jotted down ideas about how best to fit a building into such an irregular plot. He explained, "I sketched a diagonal line across the trapezoid and produced two triangles. That was the beginning." His sketch showed an isosceles triangle that would contain the exhibition space, and a right triangle that would accommodate administrative offices, a library, and a study center for art research.

The isosceles triangle ingeniously becomes the unifying motif of the building, repeated in the marble floors, steel frame and glass skylights. Even the building's hexagonal elevators, and trapezoid-shaped office desks reflect the acute and obtuse angles of the isosceles triangle.

East Meets West

A major function of the East Building is to display modern art to its best advantage while at the same time blending with the West Building. The West Building is in the neoclassical style characterized by balance and symmetry, having details related to ancient Greek and Roman architecture. To visually unite the buildings, Pei used the same pink Tennessee marble from the original quarry of the West Building for the East Building exterior. Marble dust was mixed with concrete to create the beautifully colored interior walls.

Another unifying factor is the alignment of the East Building's main entryway along the West Building's east-west axis. The East Building is the only museum bordering the Mall that does not have an entrance directly facing the Mall.

In addition to the invisible, but powerful axial link, the plaza space between the two buildings establishes a visual transition through elements such as marble paving stones and glass pyramids that reference the East Building's space frame ceiling. Pei's glass pyramids have become his signature design feature and can be found at several museums he has designed in recent years.

The Interior

Once inside, Pei wanted visitors to feel a sense of excitement yet not feel overwhelmed.

Beyond the entryway into the East Building the space fans out into a large atrium. The openness of the space invites visitors to look up and let their eyes travel around the building.

Throughout the building, Pei creates patterns with marble floor tiles and panes of glass or "skylights" in the space frame ceiling, principally using the triangle shape. The skylights above the atrium echo the glass pyramids on the plaza.

Pei realized that as vital and exciting as the interior seemed, some of the hard-edged lines should be softened if the space was to feel warm and inviting. To accomplish this, he designed large round planters which would contain ficus trees. This would provide a sense of scale to the large, open atrium. He also felt that abstract sculpture would provide scale and invigorate the large modern building.

Commissioned Works

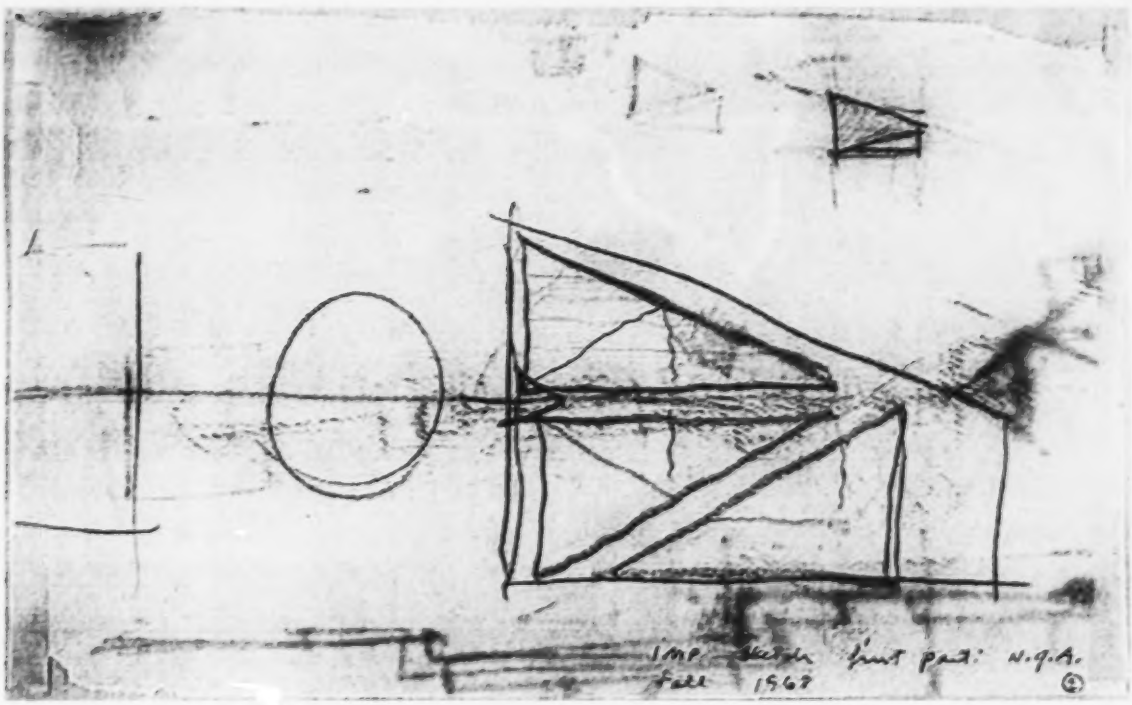
Several abstract works were commissioned by major artists of the late twentieth century. The huge, biomorphic forms of Henry Moore's Knife Edge Mirror Two Piece located on the outdoor porch of the East Building, provide a striking contrast to the building's soaring acute angles. On the interior, Alexander Calder's Untitled (Mobile) and Joan Miro and Josef Royo's massive tapestry Woman enliven the atrium space with their large biomorphic shapes and bold primary colors. From above, Calder's gracefully rotating mobile creates a sense of dynamism; the tapestry's textures similarly animate the wall with a rich, wooly surface. The large, black and white calligraphic forms of Robert Motherwell's painting Reconciliation Elegy provide a powerful, but sober counterpoint to the building's soft pink marble interior.

Interpreting Architecture

When looking at architecture ask the following questions: What is a building's function? How does its architecture serve that function? With what kind of land did the architect have to build upon? What materials are used? What shapes are most prevalent? Which colors, textures, and decorative motifs are present?

Architecture is our oldest and most accessible art form. It is ever present in our lives and has been throughout history. But for these very reasons we sometimes take it for granted. Therefore, using fresh eyes, reconsider the buildings around you.

I.M. Pei's East Building - Solving Problems of Form and Function



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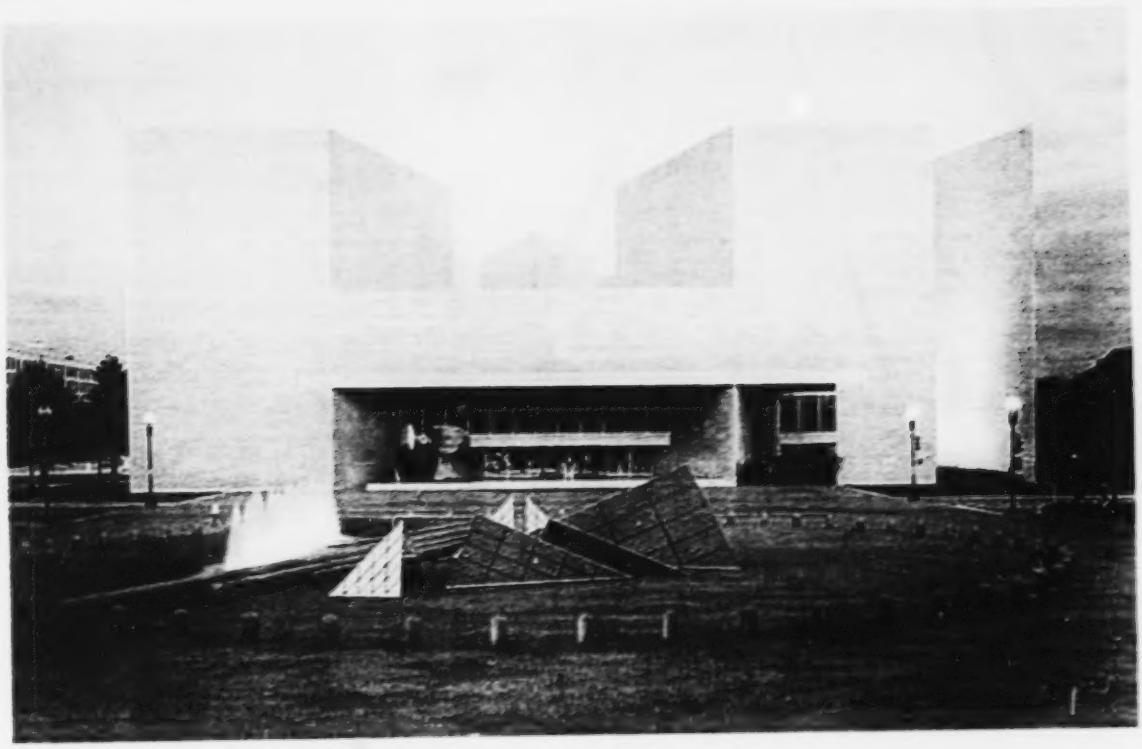

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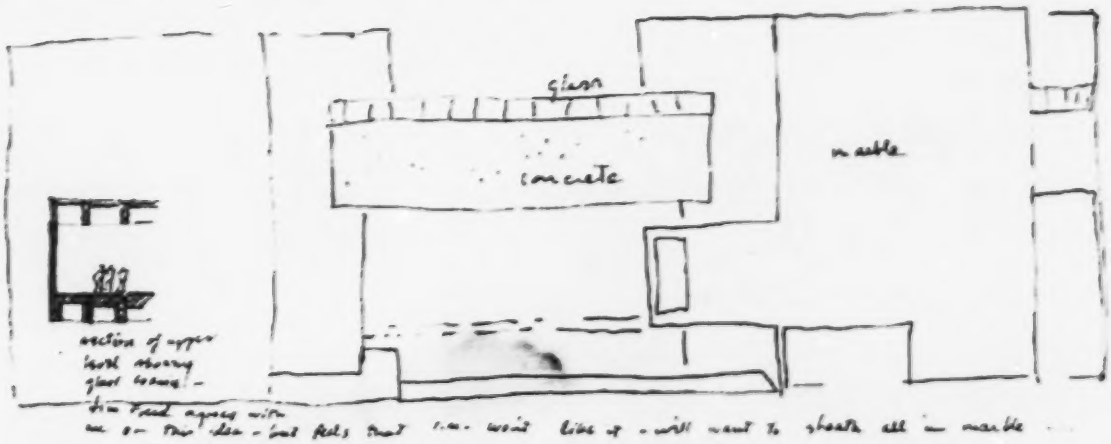

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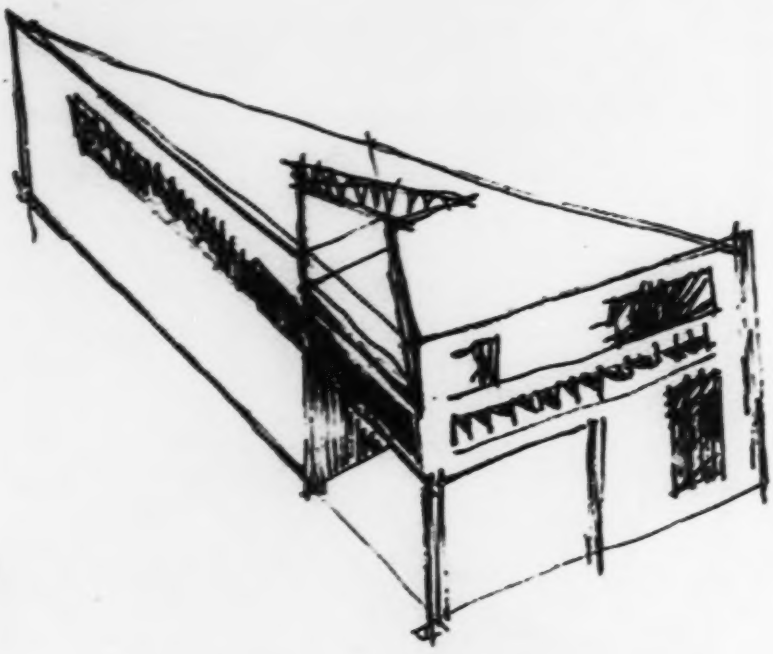

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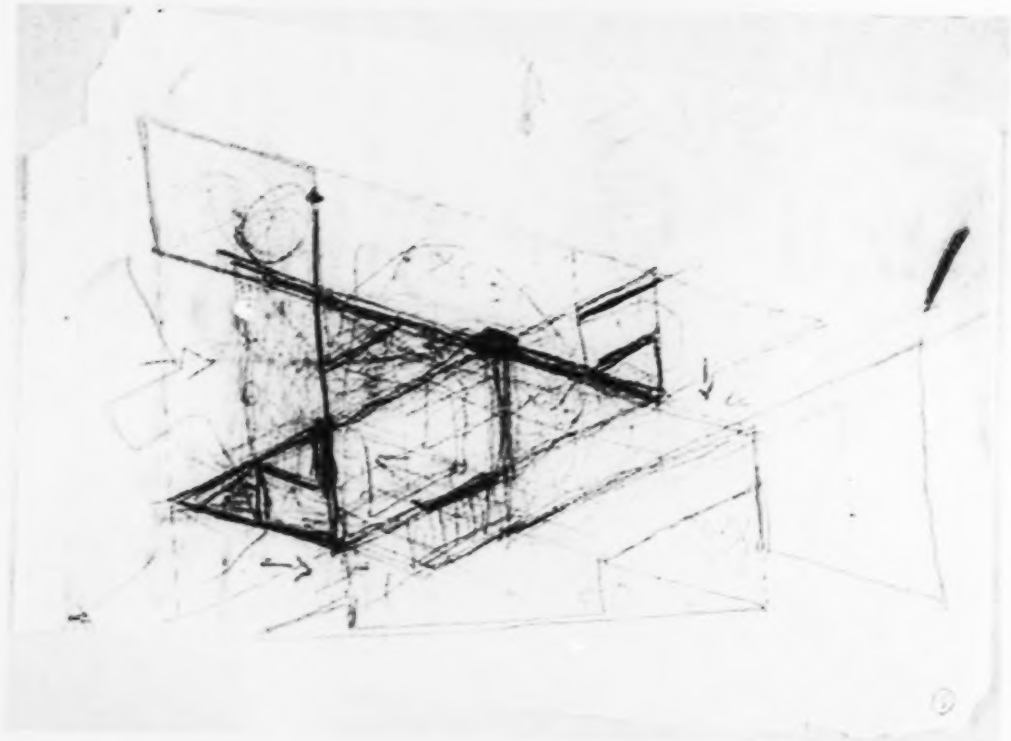

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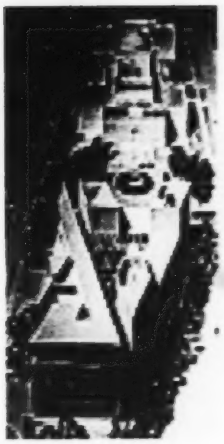

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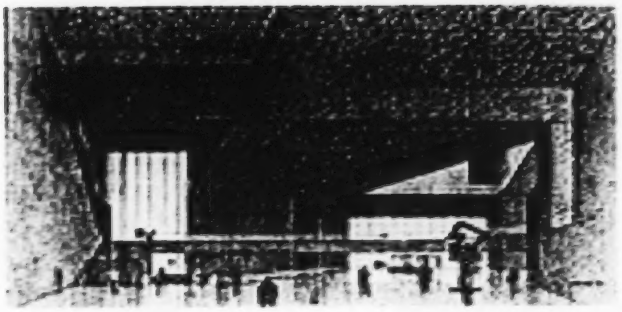

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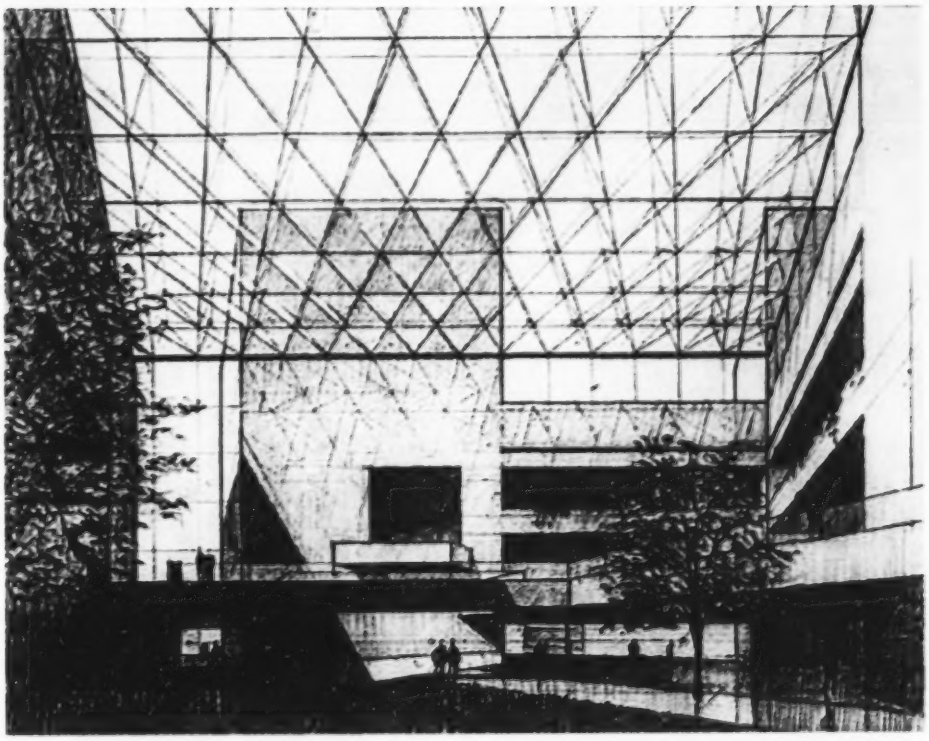

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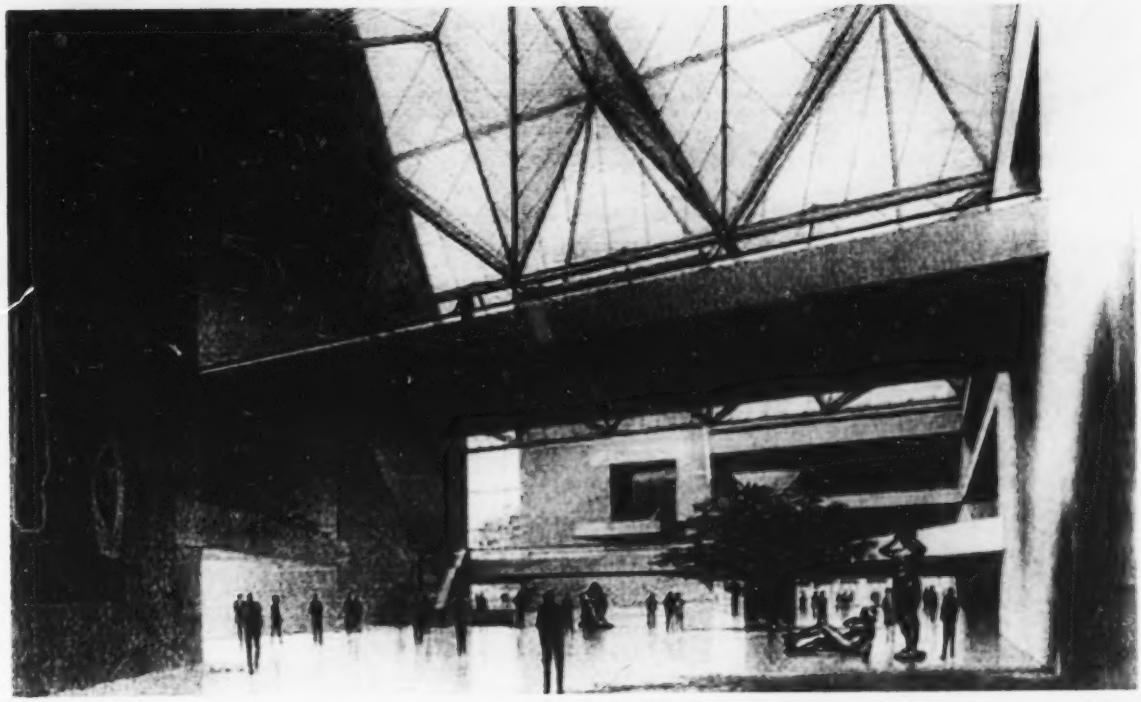

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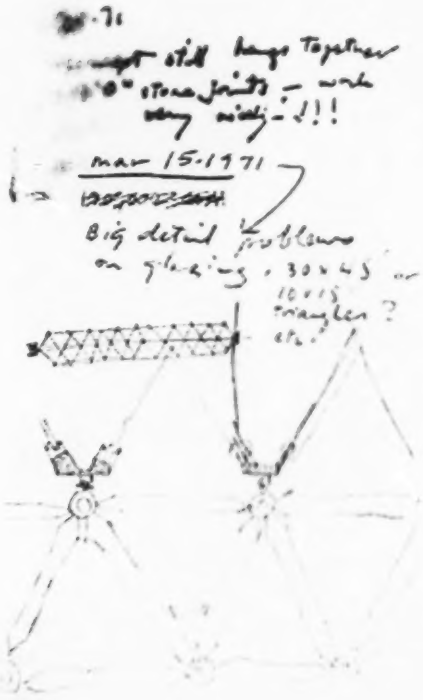

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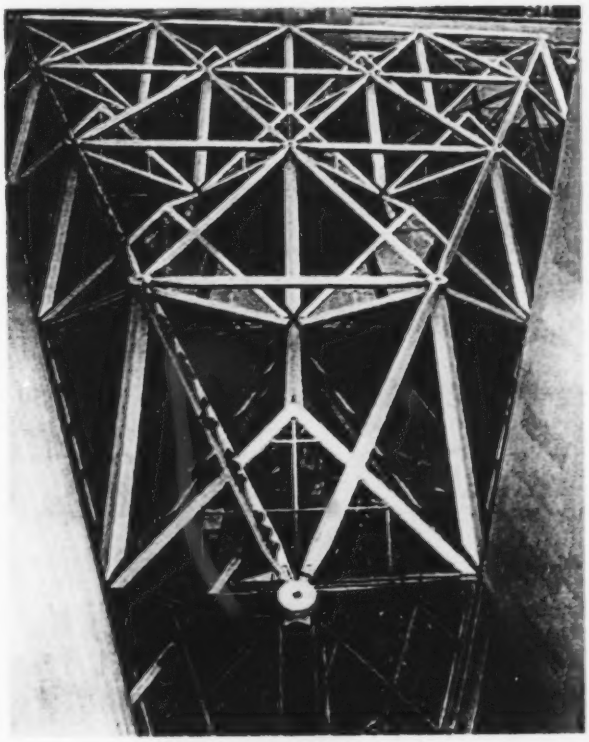

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Captions

1. I. M. Pei. Early conceptual sketch for building plan, National Gallery of Art East Building, fall 1968. Crayon and graphite on tracing paper
2. National Gallery of Art Fourth Street Facade, Photograph by Dennis Brack/Black Star
3. I. M. Pei & Partners, National Gallery of Art East Building Design Team. Study for Fourth Street facade. Pen on tracing paper
4. I. M. Pei & Partners, National Gallery of Art East Building Design Team. Study for Third Street and Mall facades, no. 3. Pen (or pen and graphite) on tracing paper
5. I. M. Pei Working sketch for building plan, National Gallery of Art East Building, winter 1969. Pen and graphite on tracing paper
6. Scale model of East and West Buildings showing final design for Third Street facade, spring 1971
7. Paul Stevenson Oles. Perspective study for garden court, National Gallery of Art East Building, 6 November 1970. Graphite on paper
8. Paul Stevenson Oles. Perspective study for skylight system, National Gallery of Art East Building, 25 January 1971. Graphite on paper
9. Paul Stevenson Oles. Perspective study for space frame with light diffusion bars, National Gallery of Art East Building, June 1971. Graphite on paper
10. I. M. Pei & Partners, National Gallery of Art East Building Design Team. Study for space-frame node, 15 March 1971. Pen on tracing paper
11. Unfinished space frame from above, 25 July 1977. Photograph by Stewart Brothers

What is a Mall?

A seventeenth-century ballfield. A broad, grassy walkway. A cluster of shops. What do they have in common? They are all malls. The word mall is derived from the term pall-mall alley, a grassy strait where pall-mall, a game similar to croquet, was played in seventeenth-century England. By definition, a mall is an area often set with shade trees and designed as a promenade. The shopping mall was originally an area featuring a variety of shops surrounding an open-air concourse.

The Mall referred to in this article is the National Mall, a 146 acre grassy promenade in Washington, D.C. which is bounded by the Capitol, the Lincoln Memorial, the National Gallery of Art, several Smithsonian museums, the Washington Monument, the Vietnam Veterans Memorial, and the Korean War Veterans Memorial.

ACTIVITIES

Elementary
Write a poem or draw a picture of your favorite place. Think about how you feel when you are there. What kinds of activities do you do there? Does it remind you of any sights, sounds, and tastes?

Middle School
The primary shape of the East Building is the triangle. Based on the triangle, Pei included other related forms, such as the tetrahedron and the trapezoid, and incorporated them into the building's structure and decor. How many shapes or three-dimensional forms can you create by combining similar and different types of triangles? (squares, rectangles, and diamonds) Use straws and thin wire to create your ideas in three dimensions.

Imagine an office, desks and bookshelves included, in which the corners are not squared off, that is, they do not have right angles. What benefits or problems could you foresee?

High School
Compare and contrast a historic building to a classical building in your vicinity. Consider style as a reflection of taste and technology of the eras in which they were built, as well as each building's function. Research their architects and benefactors. How do the buildings reflect their influences?

Resources

Daniels, Maygene, "From the Archives: A Design for the National Gallery of Art: Celebrating the Twentieth Anniversary of the East Building," National Gallery of Art Bulletin, No. 19, (Spring 1998): 32-37.

The National Gallery Builds (cat. no. 133/vc 133) and A Place to Be: The Construction of the East Building of the National Gallery of Art, 1968-1978 (cat. no. 134).